REMARKS

Claims 2 and 4-20 are pending in this application. Claims 4-19 are withdrawn from consideration. Claims 2 and 20 are rejected. No amendment to the claims is made in this Response.

The rejection of claim 2 under 35 U.S.C. 103(a) as being unpatentable over Tamano et al. (US 5,811,834) as set forth in paper no. 7, par.10, is maintained. (Office action paragraph no. 6)

Reconsideration and withdrawal of the rejection of claim 2 are respectfully requested.

In the final Office action, the Examiner addresses Applicants' argument on pages 11-12 of the Amendment, that in Tamano et al., only the material of a single conductive film, i.e., the alkaline metal, the alkaline earth metal, Ru, etc., is disclosed, and a protective and conductive film is **not** disclosed. The Examiner refers to the teaching of Tamano et al. in column 24, lines 47-48, that the cathode may be formed of two layers or more. The Examiner states that these may include materials such as magnesium and calcium (i.e., alkaline earth metals), as well as titanium and ruthenium, and that this provides a suggestion for the recited first conductive film and second conductive film.

However, Applicants continue to submit that Tamano does not suggest the two films of claim 2.

As shown in Fig. A of the attached paper, the cathode of claim 2 consists of the first conductive film that contains an alkaline metal or an alkaline earth metal and the second conductive film that is arranged on the first conductive film and is prepared in order to prevent oxidation of the

first conductive film. The second conductive film contains at least one metal selected from the group consisting of Ru, Rh, Ir, Os, Re and the oxides of Ru, Rh, Ir, Os, Re.

On the other hand, in Tamano et al. (US 5,811,834), "the electrically conductive material used for the cathode is suitably selected from those having a work function of smaller than 4 eV. This electrically conductive material includes magnesium, calcium, tin, lead, titanium, yttrium, lithium, ruthenium, manganese, and alloys of these". However, no conductive film for preventing oxidization of the cathode is prepared.

In column 24, lines 47-48, of Tamano et al., it is stated that "the cathode may be formed of two layers or more as required." However, there is no description or suggestion in Tamano et al. in regard to what each layer would consist of or how the conductive material should be arranged when the cathode has two layers. In particular, there is no description or suggestion that the two layers would even be of different materials, when the cathode has two layers.

Applicants therefore submit that Tamano et al. does not disclose or suggest the structural and chemical limitations recited in claim 2, and that claim 2 is novel and non-obvious over Tamano et al.

The rejection of claim 20 under 35 U.S.C. 103(a) as being unpatentable over Tamano et al.(US 5,811,834) in view of Arai et al. (US 2001/0041268) as set forth in paper no. 7, par.11, is maintained. (Office action paragraph no. 7)

Reconsideration and withdrawal of the rejection are respectfully requested.

As shown in Fig. B of the attached paper, the cathode of claim 20 consists of the first conductive film that contains an alkaline metal or an alkaline earth metal and the second conductive film that is arranged on the first conductive film, which is prepared in order to prevent oxidization of the first conductive film, and is a two-layer structure. The second conductive film is formed of a conductive film containing at least one of Ru, Rh, Ir, Os, Re and the oxides of Ru, Rh, Ir, Os, Re, and a layer that is formed of a TiN film or a TiN/Ti film.

On the other hand, as noted above, no conductive film for preventing oxidization of the cathode is prepared in Tamano et al.

In Arai et al. (US 2001/0041268), the protective electrode is prepared on the electron injecting electrode (the cathode) that is formed of an alkaline metal, an alkaline earth metal, etc. in order to protect the electron injecting from the oxygen. However, the protective electrode consists of only the film formed of the TiN film, etc. In other words, the protective electrode is not a two-layer structure of a layer that contains any one of the metal selected from the group consisting of Ru, Rh, Ir, Os, Re and the oxides of Ru, Rh, Ir, Os, Re, and a layer that is formed of a TiN film or a TiN/Ti film.

Therefore, even if the protective electrode of Arai et al. is substituted for the cathode of Tamano et al, this combination does not provide the cathode of claim 20.

Applicants note generally that, in claims 2 and 20, it is prescribed that the cathode is a two-layer structure or three-layer structure, and contains the semiprecious metal of Ru, Rh, Ir, Os and Re

in the upper layer or the second layer or the third layer. This is because the following characteristics ①, ② are in such semiprecious metals.

① Oxygen does not penetrate

② There is conductivity even if it oxidizes

For example, suppose that the cathode consists of the first layer that consists of Mg, and the second layer that consists of Ru and is arranged on the first layer. In this case, if the cathode touches oxygen, only the surface of the second layer will oxidize and the oxidation will produce RuO_2. In the second layer, penetration of oxygen is prevented by the surface oxidation. Consequently, the first layer under the second layer does not oxidize. Moreover, since there is conductivity in RuO_2, the second layer can be used as the electrode as it is. In addition, when the second layer is made into the laminate film formed of Ru film and RuO_2 film on the Ru film, since the flatness on the surface of the second layer is good while preventing the penetration of oxygen and holding the conductivity of the second layer, it becomes the second layer with more high practicality.

When the cathode consists of the first layer that consists of Mg, and a second layer that consists of TiN and is arranged on the first layer, since the TiN layer has a good oxygen barrier characteristic, the first layer does not oxidize and the second layer can be used as the electrode as it is, too. This is because, in the TiN layer, oxygen segregates on grain boundaries. This differs in mechanism from the case of the Ru layer.

Applicants note that there is no suggestion in either Tamano et al. or Arai et al. for either of these mechanistic reasons for selection of particular materials and structure of the cathode.

Applicants therefore submit that claim 20 is novel and non-obvious over Tamano et al. and Arai et al., taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Figures A and B

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